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1833



*Magill (A.D.)*  
AN  
INTRODUCTORY LECTURE,

TO

PHYSIOLOGY,

DELIVERED TO THE MEDICAL CLASS

OF THE

UNIVERSITY OF VIRGINIA;

BY

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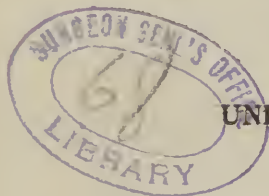
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The Subscriber will be much  
obliged to Dr Darglison for a  
copy of his introductory lecture  
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## LECTURE, &C.

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GENTLEMEN :—In appearing before you for the first time, in the capacity of your instructor, in the highly important and interesting branch of science, which has been allotted to me in this University, founded by the exertions, and planned by the genius of our immortal Jefferson, I feel oppressed by various and conflicting emotions, which alternately cheer me with the pleasing hope of being able, by industry and perseverance to perform my duties to your satisfaction, my own honor and the credit of this Institution; and again sink me into despondency, from the fear of failing in all these particulars.

Succeeding to the Chair of Medicine, long occupied by my distinguished predecessor, and adorned by his talents, I can scarcely hope to compensate you for his loss, except in my ardent zeal to promote your improvement, and my firm determination to devote all my powers, mental and physical, to the performance of the high and important duties which have devolved upon me. I have indeed every motive which ought to actuate an honorable mind, to stimulate me to exertion and unceasing diligence in fulfilling the high and multifarious requisitions of my office. Your own advancement in Medical knowledge, the ability with which this chair has been heretofore filled, my interests and prospects in life, which are now identified with the prosperity and success of this University; and last, though not least, justice to my colleagues, imperatively requires that I should spare no pains, and shrink from no labor however severe, in my endeavours to sustain at least, if not to advance the reputation of this School. a

And may I not hope that on your part, you will second my endeavours, and sustain me in the execution of my arduous task, by an assiduous attention to the various departments of Medicine which it is my province to illustrate, and your duty to learn. It will be in vain for me to lecture or for you to listen, unless you give permanence and durability to what you hear, by private study and meditation. Lectures may perhaps awaken a latent propensity, or enkindle a transient inclination, "but unless the new-born flame be fed and fostered—unless it be nourished by study, as well as excited by hearing, it will perish as soon as lighted up; or, if it con-

tinue, will only blaze forth in a soppery of knowledge far more contemptible than the grossest ignorance."

*m* Physiology may be defined the science of life. Its object is to elucidate and explain the healthy functions of the system, and to ascertain and define those laws of vitality which preside over and control the motions of the animal economy. Anatomy unravels the structure and displays to our view, the exact situation of each and every part of our physical frame. Physiology expounds the functions, and explains the particular part which each organ performs, in the healthy economy of our system. In the language of Dr. Rush, "Simple Anatomy is a mass of dead matter. It is physiology which infuses life into it. A knowledge of the structure of the human frame occupies only the memory. Physiology introduces it to the higher and nobler faculties of the mind."

*u* And what study, let me ask you, can be more delightful to an intelligent mind, than an investigation of those functions through the exercise of which "he lives, moves, and has his being?" What more pleasing task than to trace the wisdom of our Creator in the formation of our body, and its admirable adaption to all the circumstances of this sublunary state? What more effectual antidote to the dark and gloomy speculations of the Atheist, than the wonderful display of wisdom, and design, as exhibited especially in the structure of the nicer and more delicate organs of our frame? In the beautiful organization of the eye, there is more than enough to stagger the incredulity of the most hardened sceptic; "in its simplicity of action," too (as remarked by an eloquent writer,) "so perfect, so unspeakably perfect, that the searches after tangible evidences of an all-wise and good Creator, have declared their willingness to be limited to it alone in the midst of millions as their one triumphant proof."

Like all the other branches of Medicine, physiology has been slow in reaching even its present imperfect state, when the veil of mystery still remains over many of the operations of our system. In the early periods of Medicine, we find it encumbered with a mass of false assumptions, absurd fancies and ridiculous opinions. It would be sheer waste of time to repeat them all to you. Ignorant of the circulation of the blood, and uninformed as to almost every other function of the body, physicians gave free scope to their imaginations, and to use the language of an eloquent writer, "so ample an exhibition of human invention, might gratify our vanity, if it were not more than counterbalanced by the humiliating view of so much absurdity, contradiction and falsehood."

The discovery of the circulation of the blood by Harvey, about

the middle of the 17th century, like the discoveries of Galileo, in Astronomy, marks an important era in the history of physiological science, and like them also meet with the most bitter and unrelenting hostility.

A vague notion of a circulation of blood through the system, was entertained by various writers even of an early date. Servetus who was burned as a heretic at Geneva, in 1553, approached nearer to it than any one who had preceded him, and actually taught what is called the lesser circulation, or that through the lungs.—About a century after this, the illustrious Harvey, established by incontrovertible arguments, the fact that the arteries conveyed the blood from the heart to every part of the system, and that the veins returned it back again to the same organ. Like all important discoveries, which tend to revolutionise and destroy prevailing opinions and long fostered prejudices, it was received, not only with distrust, but met with the most decided opposition from the physicians of that day. A discovery so brilliant in its character and results, and which has been the foundation of all the improvements since made in the theory and practice of the healing art, was attempted to be put down, simply because it was new and irreconcilable with their absurd notions.

The opinion had been long entertained, and was universally believed, at that time, that the liver was a sort of manufactory of the blood; and that it was sent out from thence by the veins, to nourish and sustain the body; and that it circulated from within outwards during the day, and returned at night—that the arteries contained air or animal spirits, which by mixing with the blood, gave animation and activity to the functions. These opinions were pertinaciously adhered to, notwithstanding the clear and beautiful demonstration of the true circulation, by Harvey. They had become great and important doctrines, and were to them sacred from their age.—They had imbibed them from their most distinguished teachers, and not only their practice, but all that they themselves had written and taught, were based upon the supposed truth of these opinions. If the Harveian doctrine should prevail, the result would be the complete overthrow of all their fine-spun theories, and the volumes they had written would be looked upon only as so many monuments of folly and error. These considerations sharpened the edge of their opposition, and gave bitterness to their hostility.

The doctrines of Harvey, however as might be supposed, triumphed over these absurdities of a barbarous age, and dissipated their idle notions about humors, and temperaments, and spirits and blood : of the blood concocted in the liver, and moving out by day



to nourish the body, and returning during the night; and of the arteries containing only air or vital spirit, to animate the system, while the veins alone conveyed the proper blood.

This important discovery however of the great Harvey, as beautiful as true, failed for a long time to shed its beneficent influence over the science of Medicine. The mind of man ever prone to leave the path of severe inquiry, and persevering research; and generally preferring to adopt the suggestions of a wild and wayward imagination, soon began to build upon it the most absurd and visionary theories. I shall give you a brief and rapid sketch of some of them, which succeeded each other as wave follows wave, and then bring down the history of physiology to the present time.

The first which merits attention, is that of Boerhaave, and some of his distinguished contemporaries, which from the great eminence of its author as a teacher of Medicine, and his exalted virtues, as a man, soon acquired the most unbounded ascendancy, and reigned with undisputed sway over the Medical world, until it was in turn supplanted by others equally as absurd. Boerhaave fancied that the blood was composed of particular globules, the larger globules of smaller ones, and these of still more diminutive ones; that the arteries were so proportioned to the diameters of these globules, and descended by steps so regular and uniform, that each artery was adapted to globules of a certain size, which entered it with ease; and that if any of the globules, should in consequence of violent and irregular action of the blood vessels be driven into vessels whose calibre happened to be too small, they were immediately arrested, constituting what he termed an error loci, and giving rise to inflammation or general disease.

It is strange that this opinion unsupported by any satisfactory reasons, and with no facts to sustain it, should ever have acquired the unbounded popularity, and universal credence, which it once possessed. Hundreds from all parts of Europe annually flocked to his eloquent lectures, and returning home thoroughly imbued with his opinions spread them far and wide. Notwithstanding all this however, his medical doctrines survived him but for a brief space. The mere offspring of imagination, when deprived of the fascinations of his eloquence, they soon descended into the same tomb with him, and are now remembered only as a part of the history of physiological science. The fate of Boerhaave's doctrines affords a striking example of the truth of a remark made by the celebrated John Hunter, in one of his introductory lectures: "Those teachers (says he) who study to captivate young minds with ingeni-



ous speculations, will leave behind them a reputation that will not outlive them half a century."

Boerhaave was succeeded by what were termed the mechanical physiologists, who made the vain attempt to explain all the phenomena of living matter, by the application of the laws of mechanical Philosophy. By Algebraical and Mathematical problems they pretended to calculate the exact force of the heart; the velocity of the blood, the form of the arteries and the strength of the veins, and the shape and size of each secreting orifice, according to the secretion it had to perform. Such were the notions promulgated by the great men of that day, and which rendered famous the names of Beleni, Keil, Pitcairn, Hale, and other mechanical physicians, and "whose books, as remarked by a distinguished writer, are long since gone to the tomb of all the Capulets."

They forgot in their eagerness to theorise, and their rage for calculation, that physiology is an independent science, resting upon truths and regulated by laws of its own, and that living matter is not subject to physical laws, "neither indeed can be." It is true that a knowledge of physics, aids us in the comprehension of many of the functions of life; thus for the better understanding of the mechanism of sight and hearing, Physiology borrows from the science of acoustics and optics, elementary notions of sound and light, and we call in the aid of Chemistry for information as to the intimate nature or structure of the solids and fluids of the body, and Geometry and Mechanism furnish us with the means of better understanding the advantageous form of the organs, and the perfection of their structure.

We have too, in the organization of man and beast, a beautiful example of the application of the laws of hydraulics, in regulating the flow and restraining the impetus of the blood, to the most delicate and important organ of the frame. The blood which is sent to the brain by four large arteries, and impelled with all the contractile power of the left ventricle of the heart, would unquestionably have injured its soft and delicate texture if thrown into it *en masse*. Nature has wisely provided against this, by dividing the blood, into an infinity of streams, by endless divisions and sub-divisions of the cerebral arteries before they penetrate the cerebrum. The *rete mirabile* of quadrupeds presents a similar arrangement. The assistance however derived from these sciences is accessory merely, and does not constitute an essential part of the edifice of the science.

The science of chemistry, which had been for a long time wasting its powers in the vain pursuit after the philosophers stone and the universal solvent, was at length wielded in the cause of philosophy.

"Having analyzed the materials of the druggists, the chemists proceeded to analyze the parts of the human frame to which those medicines were applied; but from this rational commencement, followed one of the most trivial of all the miserable doctrines with which our science has been disgraced; for as the chemists had already explained the properties of the salts, metals, earths, and of all active substances by the angles, cubes or other forms which they saw their particles assume—they soon persuaded themselves that such form as cubes, wedges, speculæ, existed in the blood; and acid and alkaline humours, sharp, corrosive, irritating and pointed particles, were the terms in which they expressed their most admired theories: and acids, alkalies, and metals, and medicines for rounding the pointed particles, or obtunding (as they termed it) or sheathing, or covering the acrimonious humours, were their chief preventives and cures."

Such were the spurious fruits which soon sprang out of Harvey's discovery of the circulation of the blood. What might by proper use have been rendered a blessing to mankind, was for a time converted rather into a curse, by the intellectual obliquity and rage for theorizing which possessed the minds of physicians at that time. Each of these different sects held for a short period the supremacy over the medical world, and were looked up to by their votaries with the most blind and implicit faith.

Physiology continued in this deplorable state, until the appearance on the stage of the great Haller, who is deservedly considered as the father of modern physiology. Gifted with talents of the first order, an industry which never tired, and a zeal which nothing could damp, he cultivated science generally with a success which has been rarely equalled, and became the most learned man of his age. To physiology he devoted a large share of his attention. Unlike his predecessors, however, he established and followed the method, (which alone can confer success) of investigating the phenomena of the living body by observation and experiment, and keeping all hypothetical speculations in rigid subjection to these two leading principles. The improvements he made in the science were great: Discarding the application of physical laws to explain the operations of living matter, he examined closely and enquired diligently into the nature of the specific powers of vitality, and was led to refer all the actions and movements of the animal economy, to the existence of two inherent principles in the constitution of man, viz: contractility and sensibility, the one seated in the muscular, the other in the nervous system. This with some little modification, continues to be even at this time the prevailing opinion. To the action of one or

the other of these principles, as will hereafter be explained, may be referred all the phenomena which takes place in the system: every change, all the functions of the body are performed through their immediate operation.

The example of Haller, his manner of investigating physiological subjects, the useful facts which he was the first to draw from the analogies afforded by the study of comparative anatomy, gave an impulse to the science which it has never ceased to feel, and the publication of his *Elementa Physiologiæ*, may be said to constitute a new era in physiology.

Since the days of Haller to the present time, the field of physiology has been occupied by many and successful cultivators—Cullen and John Hunter, his more immediate successors, contributed much to its improvement; the first by systematizing what was already known, and sweeping away the rubbish of antiquity which obscured and disfigured it; and the latter by the number of new and interesting facts with which he enriched it. His profound work on the blood is a monument of patient research, and originality of conception.

Among modern physiologists, no one stands higher than Bichat; possessed of great intellectual powers, he united to them the most unwearied industry. He investigated the structure and functions of the body with a diligence and perseverance never surpassed, and a success which has left us but too much reason to deplore his premature and early death, cut down in the prime of life, and in the midst of his labors, he has nevertheless left us in his works "the enduring produce of immortal mind." In his general anatomy, in which we have a separate consideration of each organic tissue of the body, accompanied by many and interesting physiological remarks, we have an evidence of his genius which will last as long as learning is respected or science has a votary.

Science generally, and physiology especially, has to deplore the recent death of one who devoted a long life to its investigation and the good of his fellow creatures; I mean Charles Bell, of London, whose brilliant discoveries in that most interesting but intricate portion of the body, the nervous system, *has* greatly enriched the science of physiology, and added new lustre to a name already high on the roll of fame.

At the present time too, physiology is cultivated with a zeal, and in a manner, especially on the Continent which promises the most useful results. Its votaries, both numerous and distinguished, have long since ceased to follow the false lights of the ~~the~~ imagination; which had led astray and bewildered the minds of its earlier cultivators, and adhere strictly to facts and experiments in their investigations: and

with such guides what may not be expected from their researches?

We have now brought down the history of physiology to the present time, and by taking a retrospective view of the field over which we have rapidly travelled, we may ascertain, and by ascertaining learn to avoid the errors which not only long anterior but subsequent to the discovery of the circulation of the blood, retarded the progress of physiology, and clothed it with obscurity and mysticism. We see the fatal mistake which entered into the speculations of the earlier physiologists, that of considering the human body as a lifeless and inanimate machine, and the consequent endeavor to account for its phenomena by the application of the laws of a single science as chemistry, hydraulics, &c. while a union of the laws of all these sciences will fail in satisfactorily explaining the simplest function of the human body. They threw out of their calculation, the existence of that great conservative principle of the animal economy, life, which pervading every portion of the frame, gives animation and energy to every function of the body; resists and overcomes the laws of inanimate matter, which else would soon dissipate our material fabric into "thin air," and binds together the various parts of the system in admirable and harmonious action. The phenomena, too, presented by living beings, vary with the different periods of life. From helpless infancy, to imbecile old age, we see nothing but change; uniformity belongs not to them. How can mathematical formulæ apply to such variable qualities? "As well might you enclose in a frail vessel, hermetically sealed, a fluid subject to expansion and of variable bulk."

"The abuse however of these sciences, (as remarked by a distinguished physiologist) should not be a reason for setting them aside altogether. The facts obtained from natural philosophy, chemistry, mechanics, geometry, &c. are so many means applicable to the solution of the great problem of the vital economy; a solution which though, as yet, undiscovered, should not be considered as unattainable; and to which we shall approach the nearer, as we attempt it with a greater number of data. But it cannot be too often repeated that he alone can hope for that honor, who, in the application of the laws of natural philosophy to living beings, will take into account the powers inherent in organized nature, which control with supreme influence all the acts of life, and modify the results that appear most to depend on the laws by which inorganic bodies are governed."

Allow me now to say a few words on the great importance of a knowledge of physiology to the physician, whose province it is to contend with fell disease, to resist with all the energies of his mind



the foes of human health and happiness; and by kindness of manner and gentleness of deportment, to mitigate when he cannot cure the "ills which flesh is heir to." How let me ask you, can any one comprehend the pathology or the nature of diseased action, when ignorant of the healthy movements of our system? The essence of Empiricism is ignorance of the pathology or nature of disease, and the consequent blindness and uncertainty of the practice, which must be just as likely to do harm as good. If you would avoid this uncertainty, you must lay the foundation of an enlightened pathology, by an attentive study of the physiology or functions of the system in a state of health. This, like a knowledge of anatomy to the surgeon, can alone make you able and successful practitioners. This knowledge, and this alone, will preserve your feelings calm, and your judgment unclouded, in the fiercer attacks of disease, when dismay and alarm are pictured in every countenance, and when the faltering voice or trembling hands of the physician might turn the scale against the patient; this alone can give you that confidence and decision in your practice, which is so necessary an ingredient in the character of a practitioner of medicine.

An excellent and learned writer, in speaking of the intimate connexion between physiology, pathology, and therapeutics, says, "all these are of high, if not equal importance. As it is impossible for a workman to set about restoring a machine to order, with any rational hopes of success, without knowing the full intent and nature of the injury it has sustained so is it equally impossible for him to acquire this knowledge, unless he has also a knowledge of the structure of the machine, and has studied its several parts methodically, and in reference to the bearing which one part has upon another."

In order to see a practical illustration of the bad effects of a want of physiological knowledge over the healing art, we need only carry our views a few centuries back, and although we may meet with some truths, and sound rules of practice, yet we shall discover a mass of error and absurdity, almost disgusting to an enquirer in this comparatively enlightened age. We perceive the best minds wandering in darkness and uncertainty, with scarcely a gleam of light to direct their course, anxiously endeavoring to find the right way, but as often led by chance into the wrong. But it is unnecessary to press this part of the subject farther; it must be obvious that medicine in all its parts cannot but be enlightened by physiology. Owing to ignorance or neglect of it the art of healing long remained involved in a mist of conjecture and hypothesis; and it is physiology which has been the guiding star of the profession in its onward and at present rapid march of improvement.

In your investigation of physiological subjects, both now and hereafter, let me recommend to you, not to limit yourself to what is already known; cultivate it with a view to discovery; explore the terra incognita of the science; let experiment and rigid observation be your guides, ever remembering, that the reveries of Stahl may amuse, but the experiments of Haller alone can instruct; and your reward may be the blessing of thousands ready to perish, for light shed upon some at present obscure and fatal disease. "The path of science is open now to every variety of age, and almost to every variety of education. Thousands at this moment behind, are pressing forward, and will surpass those that are before; and the richest and most gratifying reward I can ever receive, will be to find that many to whom this course of study is delivered, will hereafter be able to communicate to me the same proportion of information, which it is my duty to suppose I can at present communicate to them."

In the study of man, "distinguished link in being's endless chain," we cannot but be led to admire and adore the wisdom, power, and goodness of that being who has formed and fashioned us thus; who has spread around us the beauties of creation in rich abundance, and furnished us with senses for enjoying them; and above all, has bestowed upon us the high capacity and exclusive privilege of "knowing, loving, and serving him." Man is indeed the noblest work of God. In beauty and symmetry of form, in perfection of structure, and elevation of bearing, no other created being can compare with him. 'Os homini sublime dedit, cœlumque tueri.' To man God gave an upright countenance, and to survey the Heavens. Other animals move in an horizontal posture. In none of these are the senses possessed of the same degree of perfection. Not one of them so admirably provided with organs to keep up an intercourse, as a living being, with surrounding objects. The eagle, proud emblem of our country, whose sight is so keen and piercing, possesses a very dull sense of touch, taste and smell. The dog, who is endowed with a most exquisite sense of smell, has but a limited sphere of vision; in him the taste and touch are equally imperfect. In man all the senses are exquisitely developed. The sensitive centre in no one is better displayed, and fitter to direct safely the use of the organs of motion; no other animal can articulate vocal sounds, so as to acquire speech.

The striking superiority of man, however, is to be found in his intellectual attributes. Born into this world, the most helpless of living beings, he rises superior to natural defects, by the force of his intellect, and becomes fitted to exercise dominion "over the beasts



of the field, and the fowls of the air." What has not human genius accomplished? What is it not daily accomplishing? If we look to the land and to the sea, we shall every where behold the evidences of its powers and the imperishable monuments of its greatness. What would have been the state of this mighty and teeming continent, had not the mind of a Columbus suggested its existence, and conceived the bold plan of its discovery? What but his intellectual energies could have sustained and supported him through the difficulties of his mighty task, with nothing to direct his course save his compass, and the stars which gleamed over his trackless and solitary way.

But man's proudest and noblest distinction, is the life he is to live, when this world shall be to him, as though it had never been. He possesses a principle within which tells him of immortality, and points him to an endless existence in another world. The dark and chilling creed, which teaches that man is dust, and that the grave is his only and final home, is at war with all our feelings, hopes, and aspirations, and is foreign to the nature of man. He feels that he is destined to take root in another soil, to be warmed by another sun, and to be nourished by other food. Human reason extends not beyond the limits of this world, but revelation informs us that it is a change fraught with good unutterable, or evil intolerable, as the case may be. To the Book of Books I refer you for infallible directions how to attain to the one and to avoid the other. Do but follow them, and you are certain to go right. I cannot better close this part of my lecture, than in the expressive words of the poet—"How complicate, how wonderful is man, how passing wonder He who made him such!"

In conclusion, allow me to offer you some advice as regards your studies. You have, gentlemen, entered upon a profession of high and difficulty attainment; a profession not surpassed by any other in its elevation and bearing on the welfare of society. Not the happiness of individuals alone, but the health, the happiness, the well being of nations; the body, the mind, are all involved in the science of Medicine. Indolence or inattention therefore in qualifying yourself to discharge the important duties of a physician, is not only disreputable but criminal. And let me assure you, that it is here, in the calm retreats of science, where you have leisure for study and profound investigation, that you must, if ever, lay the foundation, upon which to erect the super-structure of your future fame and usefulness. It is here that you must garner up in the store-house of your mind, the pabulum for future reflection, and the materials for future discoveries and inventions; and he who whose men-

tal armory is best furnished with facts and information, when he enters the world and mingles in its strife for fame and fortune, will be best qualified to win success, and profit by the observation and experience there to be obtained. This foundation can only be laid, this knowledge can only be acquired, by diligent and persevering study of the science of medicine; a science difficult beyond most others, and requiring for its mastery not only high mental endowments, but various and extensive learning. To the profession of medicine, the palm of learning, has been assigned by Dr. Parr, himself, the most learned man of his age, and by Jefferson, Doctor Johnson and others not less distinguished.

Let me beg you, then, to press forward, with industry and perseverance in the acquisition of knowledge. They are the magical keys, which will unlock for you the portals of the temple of science, and conduct you into its inmost recesses; and they alone will enable you to climb the steep ascent, "where Fame's proud temple shines afar." Let the science of medicine therefore be the chief subject of your meditations; let its volumes be constantly in your hands. "Nocturna versate manu, versate diurna."

And in thus acting you will not only comply with the demands of duty, but consult your own happiness. Independent of the approbation of your conscience, which such a course of conduct will certainly give you employment of mind or body, or both is absolutely necessary to our happiness here. The idle are never happy—with them the society of the gay and dissolute is indispensable to comfort, and too often, alas! the excitement of the bottle becomes the ruinous and hateful substitute for the healthy stimulus of mental employment. In the intoxicating cup they find a remedy, bad and temporary though it be for the distressing *ennui* of idleness and the unequalled misery of doing nothing. Well and truly has the Prince of modern Poets said—

"The keenest pangs the wretched feel,  
Are rapture to the dreary void,  
The leafless desert of the mind,  
The waste of feelings unemployed."

Let me also earnestly advise you, at the same time that you pay the necessary regard to other branches of knowledge, to bestow your chief attention upon that pursuit which is to be the employment of your life. Non omnia possumus omnes: we cannot excel in every thing. The powers of the mind, like the rays of the sun, to act with vigor and effect, must be concentrated; when dilated by too much expansion, they lose their efficiency and become comparatively feeble, hence we find that all the important discoveries in science and useful in-

ventions in the arts, have been the result of this undivided and steadfast action of the mind upon one object or branch of science. It was this singleness of object and untiring devotion to one pursuit, that enabled the sublime and mighty intellect of a Newton to unravel the glorious mechanism of the heavens; to trace the stars in their courses, and to calculate with precision the rapid flight of the comet, "shaking from its horrid hair pestilence and war;" with him it was the burning passion of his soul, all other occupations of life, nay, even the very passions of humanity, were sacrificed at the shrine of his devotion. It was this which enabled that great philosopher and incomparable man, Locke, to sound the depths of the human intellect; to analyze its operations, and establish its properties. By this intense action of the mind on one subject, Watt discovered and rendered subservient to the arts and comforts of life, the miraculous powers of steam. How incalculable the benefits, how wonderful the results of this sublime discovery? "The name of Watt will float on the breath of fame, while the unconquered arm of steam continues to widen its dominions, or history to record the achievements of genius."

Follow then the example of these great and eminent men—select your profession and pursue it with a zeal which nothing can damp, and a perseverance which will overcome all difficulties, and you will thus fulfil the fond hopes and expectations of parents—do credit to yourselves—justice to your teachers, and reflect reputation upon your Alma Mater.





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